SEQUENCE LISTING

<110> ...enberg, Miroslav
Gazel, Alix M.

<120> Genes and Polynucleotides Associated with Ultraviolet
Radiation-Mediated Skin Damage and Uses Thereof

<130> 71369.172(PFI-024US)

<140> US 09/659,737
<141> 2000-09-11

<150> US 60/155,029
<151> 1999-09-20

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  His Arg Asp Ile Lys Ala Gly Asn Ile Leu Leu Leu Glu Lys Ile Glu
   1               5                  10                  15

cat gat gac atc tgc aat aaa act ttg aag att aca gat ttt ggg ttg   97
His Asp Asp Ile Cys Asn Lys Thr Leu Lys Ile Thr Asp Phe Gly Leu
        20                  25                  30

gcg agg gaa tgg cac agg acc acc aaa atg agc aca gca ggc acc tat  145
Ala Arg Glu Trp His Arg Thr Thr Lys Met Ser Thr Ala Gly Thr Tyr
        35                  40                  45

gcc tgg atg gcc cca gaa g
Ala Trp Met Ala Pro Glu                                          164
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His Arg Asp Ile Lys Ala Gly Asn Ile Leu Leu Leu Glu Lys Ile Glu
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His Asp Asp Ile Cys Asn Lys Thr Leu Lys Ile Thr Asp Phe Gly Leu
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Ala Arg Glu Trp His Arg Thr Thr Lys Met Ser Thr Ala Gly Thr Tyr

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        His Arg Asp Ile Lys Ser Asp Ser Ile Leu Leu Thr His Asp Gly Arg
        1               5                   10                      15

      gtg aag ctg tca gac ttt ggg ttc tgc gcc cag gtg agc aag gaa gtg   97
      Val Lys Leu Ser Asp Phe Gly Phe Cys Ala Gln Val Ser Lys Glu Val
                  20                  25                  30

      ccc cga agg aag tcg ctg gtc ggc acg ccc tac tgg atg gcc cca gag   145
      Pro Arg Arg Lys Ser Leu Val Gly Thr Pro Tyr Trp Met Ala Pro Glu
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      His Arg Asp Ile Lys Ser Asp Ser Ile Leu Leu Thr His Asp Gly Arg
      1               5                   10                      15
      Val Lys Leu Ser Asp Phe Gly Phe Cys Ala Gln Val Ser Lys Glu Val
                  20                  25                  30
      Pro Arg Arg Lys Ser Leu Val Gly Thr Pro Tyr Trp Met Ala Pro Glu
              35                  40                  45


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        His Arg Asp Ile Lys Ser Asp Ser Ile Leu Leu Thr Leu Asp Gly Arg
        1               5                   10                      15

      gtg aag ctc tcg gac ttc gga ttc tgt gct cag atc agc aaa gac gtc   97
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      Val Lys Leu Ser Asp Phe Gly Phe Cys Ala Gln Ile Ser Lys Asp Val
               20                  25                  30

      cct aag agg aag tcc ctg gtg gga acc ccc tac tgg atg gcg ccc gag    145
      Pro Lys Arg Lys Ser Leu Val Gly Thr Pro Tyr Trp Met Ala Pro Glu
               35                  40                  45

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                                                                        146
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      Val Lys Leu Ser Asp Phe Gly Phe Cys Ala Gln Ile Ser Lys Asp Val
               20                  25                  30
      Pro Lys Arg Lys Ser Leu Val Gly Thr Pro Tyr Trp Met Ala Pro Glu
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agagccaaaa gagaacatga cggccctgca ctccgggatc tctctggcac cagattccca    120
gcccagggga gacacctgaa ccccccagat ggtgacacac ctctgtggtc ctctgtcagg    180
gacataacct cccagcacag atttgcaaac tccctgctgc aggcacaagc agggctatcg    240
ggccccaggt gtggctcccc tgccttggtt cagggagtgg agacacagtt gcccactgct    300
cccaccccca ctgccaggcc tcttctgccc ccatgggtcc tggggtgggg gagccttggg    360
agttgaagaa tgcctctgac ccagattctt caagcagcct ctgagctcag aggaagagtc    420
tgcctcacgg cagcctccct ggggtctagc tgtcaatcgc ccaggaagaa atacccagcg    480
cgggacccgg cggggaagct ggccttctct gtcttcccag gtgcagcaca gcgagtgtaa    540
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ggagctgtct tgggcctgcc cagcctggtg ccctgcgggg gactgctggc acaggactgt     600
gactgggctt cagctctgtc tgaaaatctt tgcttcagag cacctcccta gtttgatctg     660
ataccccgcc tgaccctgcc agagtccaga ggtcacggcg gccagcccct gcctccggga     720
aactcctctt tccgaccgcc gcagaaagac aaccccccaa gcctggtggc caaggcccag     780
tccttgccct cggaccagcc ggtgggg acc ttc agc cct ctg acc act tcg gat     840
                                Thr Phe Ser Pro Leu Thr Thr Ser Asp     894
                                1                   5
```

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acc agc agc ccc cag aag tcc ctc cgc aca gcc ccg gcc aca ggc cag     942
Thr Ser Ser Pro Gln Lys Ser Leu Arg Thr Ala Pro Ala Thr Gly Gln
10                  15                  20                  25
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ctt cca ggc cgg tct tcc cca gcg gga tcc ccc cgc acc tgg cac gcc     990
Leu Pro Gly Arg Ser Ser Pro Ala Gly Ser Pro Arg Thr Trp His Ala
                30                  35                  40
```

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cag atc agc acc agc aac ctg tac ctg ccc cag gac ccc acg gtt gcc    1038
Gln Ile Ser Thr Ser Asn Leu Tyr Leu Pro Gln Asp Pro Thr Val Ala
            45                  50                  55
```

```
aag ggt gcc ctg gct ggt gag gac aca ggt gtt gtg aca cat gag cag    1086
Lys Gly Ala Leu Ala Gly Glu Asp Thr Gly Val Val Thr His Glu Gln
            60                  65                  70
```

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ttc aag gct gcg ctc agg atg gtg gtg gac cag ggt gac ccc cgg ctg    1134
Phe Lys Ala Ala Leu Arg Met Val Val Asp Gln Gly Asp Pro Arg Leu
    75                  80                  85
```

```
ctg ctg gac agc tac gtg aag att ggc gag ggc tcc acc ggc atc gtc    1182
Leu Leu Asp Ser Tyr Val Lys Ile Gly Glu Gly Ser Thr Gly Ile Val
90                  95                  100                 105
```

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tgc ttg gcc cgg gaa gaa cac tcg ggc cgc cag gtg gcc gtc aag atg    1230
Cys Leu Ala Arg Glu Glu His Ser Gly Arg Gln Val Ala Val Lys Met
            110                 115                 120
```

```
atg gac ctc aga aag cag cag cgc agg gag ctg ctc ttc aac gag        1275
Met Asp Leu Arg Lys Gln Gln Arg Arg Glu Leu Leu Phe Asn Glu
            125                 130                 135
```

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gtgggaggac agggtgggac acacacgggg gcgttgggga tgggcagtga gcagccagcc    1335
aggctggaca tctgtgagca ggggcagtgg gtggccatgc gtctgggcac tgtgcctggc    1395
actcaggccc ccacctgccc cag gtg gtg atc atg cgg gac tac cag cac       1446
                       Val Val Ile Met Arg Asp Tyr Gln His
                           140                 145
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ttc aac gtg gtg gag atg tac aag agc tac ctg gtg ggc gag gag ctg    1494
Phe Asn Val Val Glu Met Tyr Lys Ser Tyr Leu Val Gly Glu Glu Leu
            150                 155                 160
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tgg gtg ctc atg gag ttc ctg cag gga gga gcc ctc aca gac atc gtc    1542
Trp Val Leu Met Glu Phe Leu Gln Gly Gly Ala Leu Thr Asp Ile Val
            165                 170                 175
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tcc caa gtc ag  gtgggcagct gggagggctg gaccctgagt gcaggctgcc         1593
Ser Gln Val Arg
            180
```

```
ctcaccatgg ccctgccagg gcaatgtggt cttctgcctg tggcccagaa gacttgggat
gcctgggctc ccctgcctgc tggggtaact gagacccagg ggtcttggga gaaggatagc     1653
ttctagccaa agctcaggcc ccagttttca ccagggctat gtggagaaga                1713
tgctgccaaa cagattgcct gggagctgtg gggcctagca ccagggactc ctactctgct     1773
cagccacccc acgacctgcc agagctaacg ttctctttca tcgggtggcc ccaccttcct     1833
gtccag g ctg aat gag gag cag att gcc act gtg tgt gag gct gtg ctg       1893
         Leu Asn Glu Glu Gln Ile Ala Thr Val Cys Glu Ala Val Leu       1942
         185                 190                     195
```

```
cag gcc ctg gcc tac ctg cat gct cag ggt gtc atc cac cgg gac atc
Gln Ala Leu Ala Tyr Leu His Ala Gln Gly Val Ile His Arg Asp Ile       1990
        200                 205                 210
```

```
aag agt gac tcc atc ctg ctg acc ctc gat ggc agg gtaggtccca
Lys Ser Asp Ser Ile Leu Leu Thr Leu Asp Gly Arg                       2036
        215                 220
```

```
tcctgtccct ggcacagcca cgctcccact tcctcctgat ccaccactca ctccctttc
aaccgcag gtg aag ctc tcg gac ttc gga ttc tgt gct cag atc agc aaa       2096
          Val Lys Leu Ser Asp Phe Gly Phe Cys Ala Gln Ile Ser Lys     2146
          225                 230                 235
```

```
gac gtc cct aag agg aag tcc ctg gtg gga acc ccc tac tgg atg gct
Asp Val Pro Lys Arg Lys Ser Leu Val Gly Thr Pro Tyr Trp Met Ala       2194
        240                 245                 250
```

```
cct gaa gtg atc tcc agg tct ttg tat gcc act gag gtaaccgttc
Pro Glu Val Ile Ser Arg Ser Leu Tyr Ala Thr Glu                       2240
        255                 260                 265
```

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cctccacccc ccagacctcc caaaagcaac ttggcaactg gcagctcttc tgctgtggcc
cctccagtga gctcaccaaa agcagccctg gttttcagag tcccacctag tcaacaccct     2300
tccccctttc gatgggctg ctcttaccca gtgactttgc tgccaggaac gagtcctgca      2360
agtgctttcc tcagctcaag ggcagaatgg ggtatggccg ggcctcctat gtatgatggc     2420
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actggccaca gggcaggtga ccaggggagg aaggagacag acccaccaag gagagctggg     2540
gccagctgtc cccctccac cactgctgcc accagaacgc agctaccaat gggccagggt      2600
ctggccatgg ggtcagggac attttcctcc tgcag gtg gat atc tgg tct ctg        2660
                                     Val Asp Ile Trp Ser Leu          2713
                                     270
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ggg atc atg gtg att gag atg gta gat ggg gag cca ccg tac ttc agt
Gly Ile Met Val Ile Glu Met Val Asp Gly Glu Pro Pro Tyr Phe Ser       2761
        275                 280                 285
```

```
gac tcc cca gtg caa gcc atg aag agg ctc cgg gac agc ccc cca ccc
Asp Ser Pro Val Gln Ala Met Lys Arg Leu Arg Asp Ser Pro Pro Pro       2809
        290                 295                 300
```

```
aag ctg aaa aac tct cac aag gtc agttggcaca caagggtgcg acctcgcaga
Lys Leu Lys Asn Ser His Lys Val                                       2863
        305                 310
```

```
ccccattcct cctgaggcaa ggggaccaga acctgggctc ccagcatctc ccttccactg
aagccacagg gtctgggctc ctggaaaagg ctcctctttc cccacacaaa acccgcacct     2923
gggtgtggag ccgcatctac gcacaagttc gcatgtgcgc tccgacaagt cgcctcccac     2983
ggctgtggca ggagagttgc tgcttggcag aagggttgct gcttggcagg cactggtcgg     3043
aagcccagtg gggcccatga gcaggaaag ccaggacacc agcaactccc tgctgtccag      3103
                                                                       3163
```

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ggagggatcc ggagaagctt cactgagcac aaacccttca accgtgtcg  ggagatccat   3223
accatgattc gatgtccctg tccatcacgg cgagtcggct catgctccat tcgttgcaca    3283
ccccgacaca gctaagccac agcgttcccc ttaaagccag catgctccat tcgttgcaca    3343
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cctgctggca ggtcagcacg gggctgataa gtggcaccgc aggccttact gtggacgccc    3463
aaatgtctca gagggctgaa gcctctcctc taaaatagca catctggtgg ccaaaacaag    3523
ccccaacaca aagctggatg ggaggaccaa caggaaacat cttccaagac aactggtcct    3583
tggagcccgc accgctaacc ccaaaattag catataaagc atgc                     3627
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<213>   Homo sapiens

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Leu Arg Thr Ala Pro Ala Thr Gly Gln Leu Pro Gly Arg Ser Ser Pro
            20                  25                  30
Ala Gly Ser Pro Arg Thr Trp His Ala Gln Ile Ser Thr Ser Asn Leu
        35                  40                  45
Tyr Leu Pro Gln Asp Pro Thr Val Ala Lys Gly Ala Leu Ala Gly Glu
    50                  55                  60
Asp Thr Gly Val Val Thr His Glu Gln Phe Lys Ala Ala Leu Arg Met
65                  70                  75                  80
Val Val Asp Gln Gly Asp Pro Arg Leu Leu Leu Asp Ser Tyr Val Lys
                85                  90                  95
Ile Gly Glu Gly Ser Thr Gly Ile Val Cys Leu Ala Arg Glu Glu His
            100                 105                 110
Ser Gly Arg Gln Val Ala Val Lys Met Met Asp Leu Arg Lys Gln Gln
        115                 120                 125
Arg Arg Glu Leu Leu Phe Asn Glu Val Val Ile Met Arg Asp Tyr Gln
    130                 135                 140
His Phe Asn Val Val Glu Met Tyr Lys Ser Tyr Leu Val Gly Glu Glu
145                 150                 155                 160
Leu Trp Val Leu Met Glu Phe Leu Gln Gly Gly Ala Leu Thr Asp Ile
                165                 170                 175
Val Ser Gln Val Arg Leu Asn Glu Glu Gln Ile Ala Thr Val Cys Glu
            180                 185                 190
Ala Val Leu Gln Ala Leu Ala Tyr Leu His Ala Gln Gly Val Ile His
        195                 200                 205
Arg Asp Ile Lys Ser Asp Ser Ile Leu Leu Thr Leu Asp Gly Arg Val
    210                 215                 220
Lys Leu Ser Asp Phe Gly Phe Cys Ala Gln Ile Ser Lys Asp Val Pro
225                 230                 235                 240
Lys Arg Lys Ser Leu Val Gly Thr Pro Tyr Trp Met Ala Pro Glu Val
                245                 250                 255
Ile Ser Arg Ser Leu Tyr Ala Thr Glu Val Asp Ile Trp Ser Leu Gly
            260                 265                 270
Ile Met Val Ile Glu Met Val Asp Gly Glu Pro Pro Tyr Phe Ser Asp
        275                 280                 285
Ser Pro Val Gln Ala Met Lys Arg Leu Arg Asp Ser Pro Pro Pro Lys
    290                 295                 300
Leu Lys Asn Ser His Lys Val
305                 310
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cctctcctca gcgcctaaga gagaggccca gtgcgggtga ggagtcgcga ggaagaggcg  180
gaaggcgccg gaaggacc atg ttc cgc aag aaa aag aag aaa cgc cct gag   231
                     Met Phe Arg Lys Lys Lys Lys Lys Arg Pro Glu
                     1               5                       10

atc tca gcg cca cag aac ttc cag cac cgt gtc cac acc tcc ttc gac   279
Ile Ser Ala Pro Gln Asn Phe Gln His Arg Val His Thr Ser Phe Asp
            15                  20                  25

ccc aaa gaa ggc aag ttt gtg ggc ctc ccc cca caa tgg cag aac atc   327
Pro Lys Glu Gly Lys Phe Val Gly Leu Pro Pro Gln Trp Gln Asn Ile
        30                  35                  40

ctg gac aca ctg cgg cgc ccc aag ccc gtg gtg gac cct tcg cga atc   375
Leu Asp Thr Leu Arg Arg Pro Lys Pro Val Val Asp Pro Ser Arg Ile
        45                  50                  55

aca cgg gtg cag ctc cag ccc atg aag aca gtg gtg cgg ggc agc gcg   423
Thr Arg Val Gln Leu Gln Pro Met Lys Thr Val Val Arg Gly Ser Ala
60                  65                  70                  75

atg cct gtg gat ggc tac atc tcg ggg ctg ctc aac gac atc cag aag   471
Met Pro Val Asp Gly Tyr Ile Ser Gly Leu Leu Asn Asp Ile Gln Lys
                80                  85                  90

ttg tca gtc atc agc tcc aac acc ctg cgt ggt cgc agc ccc acc agc   519
Leu Ser Val Ile Ser Ser Asn Thr Leu Arg Gly Arg Ser Pro Thr Ser
                95                  100                 105

cgg cgg cgg gca cag tcc ctg ggg ctg ctg ggg gat gag cac tgg gcc   567
Arg Arg Arg Ala Gln Ser Leu Gly Leu Leu Gly Asp Glu His Trp Ala
        110                 115                 120

acc gac cca gac atg tac ctc cag agc ccc cag tct gag cgc act gac   615
Thr Asp Pro Asp Met Tyr Leu Gln Ser Pro Gln Ser Glu Arg Thr Asp
        125                 130                 135

ccc cac ggc ctc tac ctc agc tgc aac ggg ggc aca cca gca ggc cac   663
Pro His Gly Leu Tyr Leu Ser Cys Asn Gly Gly Thr Pro Ala Gly His
140                 145                 150                 155

aag cag atg ccg tgg ccc gag cca cag agc cca cgg gtc ctg ccc aat   711
Lys Gln Met Pro Trp Pro Glu Pro Gln Ser Pro Arg Val Leu Pro Asn
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160 165 170

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    ggg ctg gct gca aag gca cag tcc ctg ggc ccc gcc gag ttt cag ggt    759
    Gly Leu Ala Ala Lys Ala Gln Ser Leu Gly Pro Ala Glu Phe Gln Gly
            175                 180                 185

    gcc tcg cag cgc tgt ctg cag ctg ggt gcc tgc ctg cag agc tcc cca    807
    Ala Ser Gln Arg Cys Leu Gln Leu Gly Ala Cys Leu Gln Ser Ser Pro
            190                 195                 200

    cca gga gcc tcg ccc ccc acg ggc acc aat agg cat gga atg aag gct    855
    Pro Gly Ala Ser Pro Pro Thr Gly Thr Asn Arg His Gly Met Lys Ala
            205                 210                 215

    gcc aag cat ggc tct gag gag gcc cgg cca cag tcc tgc ctg gtg ggc    903
    Ala Lys His Gly Ser Glu Glu Ala Arg Pro Gln Ser Cys Leu Val Gly
            220                 225                 230                 235

    tca gcc aca ggc agg cca ggt ggg gaa ggc agc cct agc cct aag acc    951
    Ser Ala Thr Gly Arg Pro Gly Gly Glu Gly Ser Pro Ser Pro Lys Thr
                    240                 245                 250

    cgg gag agc agc ctg aag cgc agg cta ttc cga agc atg ttc ctg tcc    999
    Arg Glu Ser Ser Leu Lys Arg Arg Leu Phe Arg Ser Met Phe Leu Ser
                    255                 260                 265

    act gct gcc aca gcc cct cca agc agc agc aag cca ggc cct cca cca    1047
    Thr Ala Ala Thr Ala Pro Pro Ser Ser Ser Lys Pro Gly Pro Pro Pro
            270                 275                 280

    cag agc aag ccc aac tcc tct ttc cga ccg ccg cag aaa gac aac ccc    1095
    Gln Ser Lys Pro Asn Ser Ser Phe Arg Pro Pro Gln Lys Asp Asn Pro
            285                 290                 295

    cca agc ctg gtg gcc aag gcc cag tcc ttg ccc tcg gac cag ccg gtg    1143
    Pro Ser Leu Val Ala Lys Ala Gln Ser Leu Pro Ser Asp Gln Pro Val
    300                 305                 310                 315

    ggg acc ttc agc cct ctg acc act tcg gat acc agc agc ccc cag aag    1191
    Gly Thr Phe Ser Pro Leu Thr Thr Ser Asp Thr Ser Ser Pro Gln Lys
                    320                 325                 330

    tcc ctc cgc aca gcc ccg gcc aca ggc cag ctt cca ggc cgg tct tcc    1239
    Ser Leu Arg Thr Ala Pro Ala Thr Gly Gln Leu Pro Gly Arg Ser Ser
            335                 340                 345

    cca gcg gga tcc ccc cgc acc tgg cac gcc cag atc agc acc agc aac    1287
    Pro Ala Gly Ser Pro Arg Thr Trp His Ala Gln Ile Ser Thr Ser Asn
            350                 355                 360

    ctg tac ctg ccc cag gac ccc acg gtt gcc aag ggt gcc ctg gct ggt    1335
    Leu Tyr Leu Pro Gln Asp Pro Thr Val Ala Lys Gly Ala Leu Ala Gly
            365                 370                 375

    gag gac aca ggt gtt gtg aca cat gag cag ttc aag gct gcg ctc agg    1383
    Glu Asp Thr Gly Val Val Thr His Glu Gln Phe Lys Ala Ala Leu Arg
    380                 385                 390                 395
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atg gtg gtg gac cag ggt gac ccc cgg ctg ctg ctg gac agc tac gtg      1431
Met Val Val Asp Gln Gly Asp Pro Arg Leu Leu Leu Asp Ser Tyr Val
            400                     405                     410

aag att ggc gag ggc tcc acc ggc atc gtc tgc ttg gcc cgg gag aag      1479
Lys Ile Gly Glu Gly Ser Thr Gly Ile Val Cys Leu Ala Arg Glu Lys
            415                     420                 425

cac tcg ggc cgc cag gtg gcc gtc aag atg atg gac ctc agg aag cag      1527
His Ser Gly Arg Gln Val Ala Val Lys Met Met Asp Leu Arg Lys Gln
            430                     435                 440

cag cgc agg gag ctg ctc ttc aac gag gtg gtg atc atg cgg gac tac      1575
Gln Arg Arg Glu Leu Leu Phe Asn Glu Val Val Ile Met Arg Asp Tyr
        445                     450                 455

cag cac ttc aac gtg gtg gag atg tac aag agc tac ctg gtg gga gag      1623
Gln His Phe Asn Val Val Glu Met Tyr Lys Ser Tyr Leu Val Gly Glu
    460                     465                 470                 475

gag ctg tgg gtg ctc atg gag ttc ctg cag gga gga gcc ctc aca gac      1671
Glu Leu Trp Val Leu Met Glu Phe Leu Gln Gly Gly Ala Leu Thr Asp
                480                     485                 490

atc gtc tcc caa gtc agg ctg aat gag gag cag att gcc act gtg tgt      1719
Ile Val Ser Gln Val Arg Leu Asn Glu Glu Gln Ile Ala Thr Val Cys
            495                     500                 505

gag gct gtg ctg cag gcc ctg gcc tac ctg cat gct cag ggt gtc atc      1767
Glu Ala Val Leu Gln Ala Leu Ala Tyr Leu His Ala Gln Gly Val Ile
        510                     515                 520

cac cgg gac atc aag agt gac tcc atc ctg ctg acc ctc gat ggc agg      1815
His Arg Asp Ile Lys Ser Asp Ser Ile Leu Leu Thr Leu Asp Gly Arg
    525                     530                 535

gtg aag ctc tcg gac ttc gga ttc tgt gct cag atc agc aaa gac gtc      1863
Val Lys Leu Ser Asp Phe Gly Phe Cys Ala Gln Ile Ser Lys Asp Val
540                     545                 550                 555

cct aag agg aag tcc ctg gtg gga acc ccc tac tgg atg gct cct gaa      1911
Pro Lys Arg Lys Ser Leu Val Gly Thr Pro Tyr Trp Met Ala Pro Glu
                560                     565                 570

gtg atc tcc agg tct ttg tat gcc act gag gtg gat atc tgg tct ctg      1959
Val Ile Ser Arg Ser Leu Tyr Ala Thr Glu Val Asp Ile Trp Ser Leu
            575                     580                 585

ggc atc atg gtg att gag atg gta gat ggg gag cca ccg tac ttc agt      2007
Gly Ile Met Val Ile Glu Met Val Asp Gly Glu Pro Pro Tyr Phe Ser
            590                     595                 600

gac tcc cca gtg caa gcc atg aag agg ctc cgg gac agc ccc cca ccc      2055
Asp Ser Pro Val Gln Ala Met Lys Arg Leu Arg Asp Ser Pro Pro Pro
        605                     610                 615

aag ctg aaa aac tct cac aag gtc tcc cca gtg ctg cga gac ttc ctg      2103
Lys Leu Lys Asn Ser His Lys Val Ser Pro Val Leu Arg Asp Phe Leu
```

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```
          620                  625                  630                  635
    gag cgg atg ctg gtg cgg gac ccc caa gag aga gcc aca gcc cag gag    2151
    Glu Arg Met Leu Val Arg Asp Pro Gln Glu Arg Ala Thr Ala Gln Glu
                    640                  645                  650

    ctc cta gac cac ccc ttc ctg ctg cag aca ggg cta cct gag tgc ctg    2199
    Leu Leu Asp His Pro Phe Leu Leu Gln Thr Gly Leu Pro Glu Cys Leu
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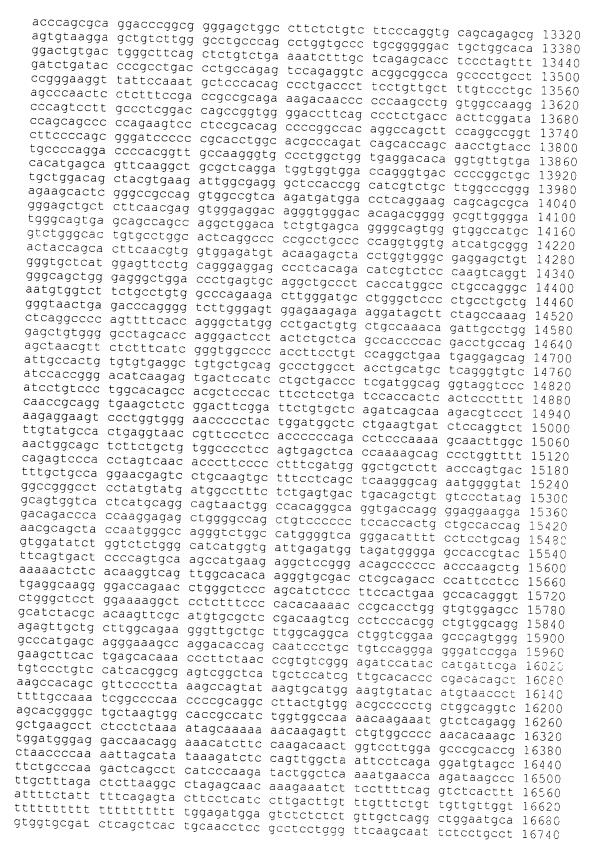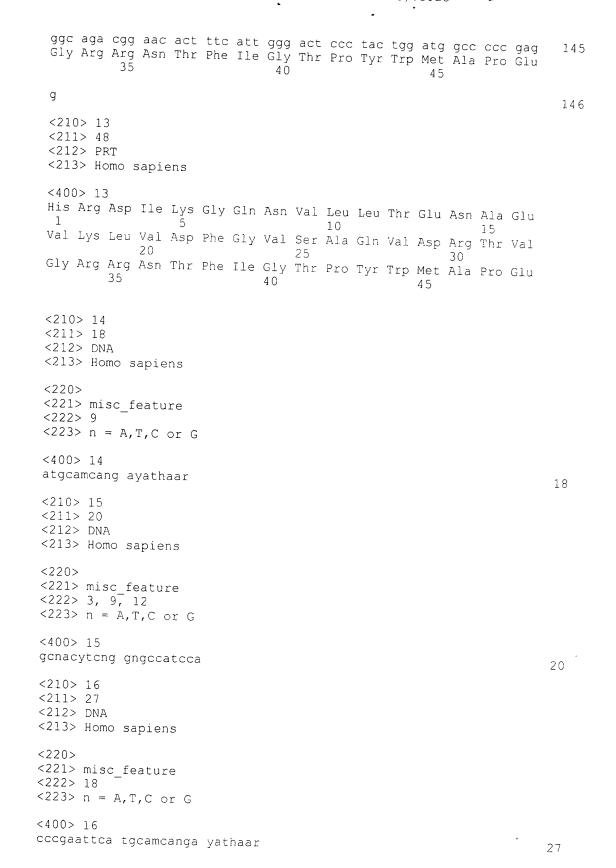
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Val Lys Leu Val Asp Phe Gly Val Ser Ala Gln Val Asp Arg Thr Val
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